DAVYDOV, V.P.

Serologic characteristics of Escherichia coli isolated in infants suffering from gastrointestinal diseases. Zhur.mikrobiol.epid. i immun. no.1:56-60 Ja '58. (MIRA 11:4)

1. Iz kafedry pediatrii Voyenno-meditsinskoy ordena Lenina akademii imeni S.M. Kirova.

(GASTROINTESTINAL DISEASES, in infant and child,
serol. of co isolated strains of E. coli (Rus)
(ESCHERICHIA COLI,
serol. of strains isolated in various gastrointestinal dis. in inf. (Rus)

GALAYEV, Yu.V.; GUBAREV, Ye.M. [deceased]; DAVYDOV, V.P.

Decarboxylation of amino acids with different strains of Escherichia coli and intestinal flora from children with gastrointestinal disorders. Zhur. mikrobiol., epid. i immun. 40 no. 8:117-122 Ag '63. (MIRA 17:9)

1. Iz Rostovskogo-na-Donu meditsinskogo instituta.

DAVYDOV, V.P., prof.; GALAYEV, Yu.V.; GUBAREV, Ye.M., prof.

Some problems of the pathogenesis of intestinal diseases caused by coli infections in young children. Pediatriia 42 no.5: 63-68 My'63. (MIRA 16:11)

1. Iz kafedry gospital'noy pediatrii (zav. - prof. V.P. Davydov) i kafedry biokhimii (zav. - prof. Ye.M.Gubarev) Rostovskogo-na-Donu meditsinskogo instituta.

DAVYDOV, V.P., prof.; NAZARENKO, G.G.; KHARAGEZYAN, G.T.

Effectiveness of neuroplegic preparations in the compound treatment of toxic forms of acute gastrointestinal diseases and pneumonia in very young children. Sov. med. 28 no.8:75-79 Ag '65. (MIRA 18:9)

1. Klinika gospital'noy pediatrii (zav. - prof. V.P.Davydov) Rostovskogo meditsinskogo instituta.

BARSUKOVA, Ol'ga Isaakovna; DAVYDOV, Viktor Petrovich; DANILOV, Nikolay Vasil'yevich; DEM'YANOVA, Tat'yana Grigor'yevna; BESSTRASHNIKOVA, M.I., red.

[Through the eyes of a doctor] Glazami vracha. Rostov, Rostovskoe knizhnoe izd-vo, 1965. 42 p. (MIRA 18:12)

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S/114/61/000/001/005/009
E194/E355

26.2124

AUTHORS: Zysin, V.A., Candidate of Technical Sciences and Davydov, V.S., Engineer

TITLE: External Steam and Evaporative Cooling of Gas-turbine Blades

PERIODICAL: Energomashinostroyeniye, 1961, No. 1, pp. 28 - 30

TEXT: Cooling of gas-turbine blades through internal ducts raises great constructional difficulties. Moreover, it is very difficult to get the heat away from the blade edges in this way. External methods of cooling gas-turbine blades do not have these defects. A long time ago Stodola considered the possibility of having gas nozzles flanked by nozzles delivering cooling air. However, the power losses were very high. The prospects of external cooling would be much improved if a flow containing suspended drops of water could be used as the cooling agent. American work has described the injection of water into the gas duct, though in this case the medium cooling the blade was steam formed by the evaporation

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External Steam and Evaporative Cooling of Gas-turbine Blades

of suspended water in the boundary layer. The unavoidable evaporation of some of the drops outside the boundary layer has some adverse influence on the cooling effect and reduces the efficiency of the cycle.
Additional possibilities of using moistened flows for external cooling are provided in combined steam gas sets in which power is drawn not only from the gas but to a certain extent from steam. It is assumed that the steam is generated by using exhaust heat. In this case steam is delivered to the gas duct at a pressure close to that in the combustion chamber and there is combined expansion of gas and steam in the single gas-steam turbine. Under such conditions all or part of the steam could be applied directly to the blades without mixing with the hot gases. A possible version of such a scheme uses a waste-heat boiler on the turbine exhaust to raise steam which is delivered to the turbine along with the gas from the combustion chamber. The gas and steam are delivered to the turbine through separate groups of nozzles

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It may be assumed that with a small number of stages the steam and gas flows can be kept reasonably separate in the turbine. However, this is not possible in turbines with many stages where the steam and gas will mix fully. The combined ideal cycle corresponding to this case is described and discussed. This scheme is claimed to have several advantages over those in which water is injected directly into the gas duct. The water formed during the expansion of saturated steam in the turbine will contain practically no salts that might form deposits in the turbine. Eq. (3) is then derived for the ratio of the temperature difference between the gas and the blade to that between the steam and the blade. By making calculations on several variants of the proposed steam/gas turbine circuit it was found that the blades of the first ring could be cooled by 50-80 °C. In practice, there would be additional losses due to the different values of relative rates of flow of gas and steam in the working blades. In single-stage turbines these

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losses may be avoided by appropriately increasing the pressure in the waste-heat boiler relative to the pressure in the combustion chamber. A variant of blade cooling is then suggested in which the blades have "two storeys" with steam flowing through the parts of the blade nearer to the shaft to keep it and the blade roots cool, and gas flowing through the parts of the blade further away from the shaft. Here, the cooling action of dry steam is quite sufficient since the process of cooling of the runner blades is limited by the thermal conductivity. For schemes with partial delivery of steam and gas to the turbine the above mentioned reduction of blade temperature by 50 - 80 °C may be insufficient considering the decrease in turbine efficiency. In this case the improvement of heat exchange by wetting the steam flow becomes of particular importance. The calculation of cooling processes with external flow, over the blades, of dry steam can obviously be based on the usual procedure used for gas flows. Data of

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External Steam and Evaporative Cooling of Gas-turbine Blades

heat exchange in a wet steam flow are not available. Concerning cooling by water injection into a gas flow, the only published data indicate the possibility of achieving blade temperature reductions of 300 - 400 °C but there is no justification for extending these results to other conditions. The only experimental work on heat transfer with two-phase flow over a cylindrical tube was carried out by R.Z. Alimov but his test conditions were so unrelated to the cooling of turbine blades by suspended water as to be difficult to use.
A systematic investigation of heat exchange in application to the problem of external cooling of blades by suspended moisture would apparently involve tests in the following sequence: study the influence of suspended water on heat exchange of a compressible flow over the outside of a single body; make experiments on blade profiles under static conditions and proceed to tests on rotating machines.

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Some results are then given of heat-transfer investigations during the flow over a single cylinder of a compressible two-phase substance. The data for cooling of this single cylinder are conveniently compared with available data for single-phase flows. Moreover, existing experimental material can indicate the rate of cooling of the leading edge of the turbine blades.
Investigations of heat exchange during flow over a single cylinder were carried out with equipment illustrated schematically in Fig. 4. The rod was installed directly in front of the nozzle and heated electrically. Moisture was injected into the flow through a nozzle. Measurements were made of the flow of dry steam or air and of the water injected through the nozzle, and of the necessary temperatures, pressures and head at the nozzle. Tests were first made with superheated steam and dry air and a relationship between the Nusselt and Reynolds numbers was constructed. Agreement with

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External Steam and Evaporative Cooling of Gas-turbine Blades

the work of previous authors was found to be good. Then the flow was moistened and further tests were made. Some of the results are plotted in Fig. 5 and the indications are that a temperature reduction of 230 - 450 °C might be expected. A number of tests were made when the steam delivered to the nozzle was dry saturated. In such cases the isoentropic expansion corresponded to a moisture droplet content at the nozzle of 3 - 7%. However, the character of the heat exchange was no different from that in a flow of dry slightly superheated steam. There is thus reason to suppose that all the moisture is apparently evaporated during retardation in the boundary layer. It is concluded that external cooling of the gas-turbine blades can be effective, particularly at the leading edges of the blades, without great structural difficulties. In addition to water injection into the gas flow, use may be made of various systems of steam cooling associated with steam

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External Steam and Evaporative Cooling of Gas-turbine Blades

generation in combined steam gas schemes. The steam cooling system with "two-storey" blades requires no moistening of the cooling steam.
There are 5 figures and 10 references: 6 Soviet and 4 non-Soviet.

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L 6774-65 AEDC(b)/ASD(p)-3

ACCESSION NR: AP4044513 S/0114/64/000/008/0041/0043

41
40

AUTHOR: Davydov, V. S. (Engineer)

TITLE: Photoelectric dynamometer for turbomachines

SOURCE: Energomashinostroyeniye, no. 8, 1964, 41-43

TOPIC TAGS: dynamometer, photoelectric dynamometer, torsional dynamometer, turbomachine, turbocompressor/FED-T1-LPI torsional dynamometer, FED-T3-LPI torsional dynamometer

ABSTRACT: New torsional dynamometers are described: FED-T1-LPI with selenium photocells intended for measuring the torque in an experimental 40-kw, 16,500-rpm centrifugal compressor; FED-T3-LPI (see Enclosure 1) intended for an experimental 600-kw, 17,500-rpm centrifugal compressor; a universal dynamometer with silver-sulfide photocells intended for measuring the torques that correspond to 38, 100, and 150 kw at 50,000 rpm (gas turbine). In the FED-T3-LPI dynamometer, 8 lamps illuminate 8 selenium photocells through

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ACCESSION NR: AP4044513

appropriate rasters. A shaft twist causes a displacement of the raster slits and a reduction of the luminous flux falling on the photocells. Special electrical means are employed to stabilize the luminous flux. The dynamometer error is claimed to be 0.5—0.7%. Orig. art. has: 3 figures.

ASSOCIATION: Leningradskiy politekhnicheskiy institut im. M. I. Kalinina (Leningrad Polytechnic Institute)

SUBMITTED: 00 ENCL: 02

SUB CODE: PR NO REF SOV: 008 OTHER: 000

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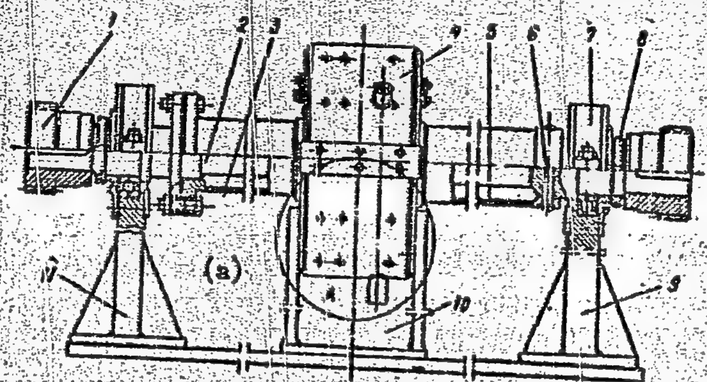
L 6774-65

ACCESSION NR: AP4044513

ENCLOSURE: 01



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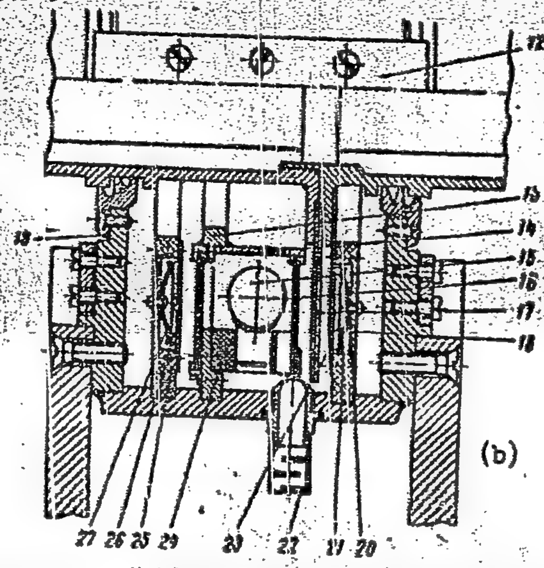
L 6774-65

ACCESSION NR: AP4044513

ENCLOSURE: 02



Card 4/4

KORNIYENKO, Viktor Trofimovich; DAVYDOV, V.S., red.; KOGAN, Ye.L., red.; ATROSHCHENKO, L.Ye., tekhn. red.

[Price and national consumption] TSena i narodnoe potreblenie. Moskva, Izd-vo "Znanie," 1963. 31 p. (Novoe v zhizni, nauke, tekhnike. III Seriia: Ekonomika, no.18) (MIRA 16:12)

(Consumption (Economics)) (Prices)

DAVYDOV, V.S.

We are striving persistently to improve service to the public.
Vest. sviazi 23 no.5:23-24 My '63. (MIRA 17:4)

1. Nachal'nik Volgogradskoy mezhdugorodnoy telefonnoy stantsii.

DAVYDOV, V. S.

~~DAVYDOV, V. S.~~

3A

B 66

J

Detection of complex frequency-modulated signals. DAVIDOV, V. S. Bull. Acad. Sci. URSS Dep. Sci. Tech. (No. 1) 83-90 (1946) In Russian.—Based on Chaffee's analysis of an f.m. detector handling a h.f. carrier, frequency-modulated by a single audio-frequency, a mathematical treatment is given of the detection of a signal which is frequency-modulated by two audio notes.

A. L.

radio (rec.) (trans)

math

DAVYDOV, V.S.

Category : USSR/Radiophysics - General Problems

I-1

Abs Jour : Ref Zhur - Fizika, No 1, 1957, No 1789

Author : Davydov, V.S.

Title : Parametric Excitation of a Tuned System with a DC Electric Machine.

Orig Pub : Vestn. elektroprom-sti, 1956, No 6, 29-38

Abstract : The vector-diagram method, subject to some simplifying assumptions, is used to analyze the self-excitation of a non-linear parametric system. The author concludes that self-excitation of electric and mechanical oscillations is possible in this system.

Odessa Electrotech Inst. of Electric Welding

Card : 1/1

Radiotechnika, 11, fasc.10, 18-24 (1956) CARD 2 / 2 PA - 1592

For the computation of the dependence of the amplification coefficient on temperature in the case of a cascade without thermostabilization for the two temperatures, in one case 20° C and then for the t-value the maximum working temperature corresponding to the greatest modification of the triode values and its properties, is taken. The first is taken, because the properties of the triode, including the current I_{ko}, undergo the greatest modifications within the domain of t $\geqslant$ 20° C. The graphical method explained here is best employed in the inverse order, in which case the location of the place of operation is assumed to be at 50° C, and it is sought for 20° C. In this way it is easy to determine the conditions at which amplification will continue to grow with rising temperature. The graphical method of computing the amplifier with thermocompensation elements is demonstrated on the basis of an example in connection with which the amplification coefficient of the cascade is supposed to remain constant from -50° C to + 50° C.

INSTITUTION:

SOV/142-58-4-22/30

AUTHOR: Davydov, V.S., Docent

TITLE: Odessa Electro-Engineering Institute for Communications (Odesskiy elektrotekhnicheskiy institut svyazi)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - Radiotekhnika, 1958, Nr 4, p 512 (USSR) ЛП-Ач.

ABSTRACT: The Department for the Theoretical Bases of Radio Engineering is working on apparatus for automatic relaying of radio programs, under the direction of Engineer A.I.Khachaturov. During 1957 important experimental material was gathered on this subject and the characteristics of various types of antennae equipment for this purpose studied. The Department of Television led by Docent M.O.Gliklikh worked out an electronic facsimile apparatus with a faster sweep which utilizes the static properties of the transmitted facsimile copies. In 1957 the department also developed an electronic type reading machine for automation of telegraph communication. Currently, automation of radio communications

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SOV/142-58-4-22/30

Odessa Electro-Engineering Institute for Communications

equipment has received much attention. Docent I.E. Sredniy conducted a team that developed an electronic characterograph for use with an oscillograph to study characteristics of non-linear elements, electronic tubes, transistors, etc.

ASSOCIATION: Odesskiy elektrotekhnicheskiy institut svyazi (Odessa Electro-Engineering Institute for Communications)

SUBMITTED: April 7, 1958

Card 2/2

SOV/120-58-6-16/32

AUTHORS: Voyshvillo, G. V. and Davydov, V. S.

TITLE: A Spectrum Analyzer for Audio Frequencies (Analizator spektra zvukovykh chastot)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 6, pp 82-84 (USSR)

ABSTRACT: The equipment is an auxiliary unit which should be used in conjunction with an external generator and an external vacuum-tube voltmeter. The block schematic of the device is given in Fig.2 and a detailed circuit diagram in Fig.3. The instrument is based on the principle of heterodyning and consists of a low-pass filter, a balanced mixer, a transformerless quartz crystal filter and a resonant output stage. The input filter has a flat amplitude characteristic from 0 to 8.5 kc/s and has a maximum attenuation at 12.5 kc/s. The quartz filter has a resonance also at 12.5 kc/s, so that it is protected from direct interaction of the input frequency which would be equal to 12.5 kc/s. The mixer is in the form of a balanced circuit which is characterised by the minimum number of the combination frequencies at its output. The quartz filter consists of two elements. Each element

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SOV/120-58-6-16/32

A Spectrum Analyzer for Audio Frequencies

consists of a resistive phase inverter, whose one output contains the crystal while the second output is furnished with a trimmer capacitor which neutralises the parasitic capacitance of the crystal. The effective bandwidth of the filter is 4 c/s. The overall bandwidth of the analyzer is practically uniform from 20 c/s to 8 kc/s, as can be seen from Fig.3. The paper contains 3 figures.

ASSOCIATION: Gosudarstvennyy opticheskiy institut (State Optics Institute)

SUBMITTED: December 30, 1957.

Card 2/2

AUTHOR: Davydov, V. S. (Odessa) SOV/105-58-7-10/32

TITLE: On a Special Case in the Synthesis of Chain Circuits (Ob odnom chastnom sluchaye sinteza tsepnykh skhem)

PERIODICAL: Elektrichestvo, 1958, Nr 7, pp. 45-51 (USSR)

ABSTRACT: Chain circuits which are formed by a series of elementary oscillation circuits, are investigated here. The investigation is limited to systems without attenuation. The problem is as follows: How can the synthesis of a chain circuit be achieved, consisting of n elementary circuits, according to given 2n eigenfrequencies under the condition that n frequencies are obtained, when the system is idling and n other frequencies (in the case of short-circuited output terminals of the circuit). A simple method taken from Ref 4 is applied for this purpose. There, a problem from the theory of mechanical oscillation systems is dealt with. This method may also be applied here. A further proof is furnished here for the synthesis of chain circuits, which is based on the property of the continued fractions and some known peculiarities of electric chain circuits. Such a proof is, according to the author's opinion, more simple and moreover, has an "elec-

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trotechnical" character which corresponds better to the nature of the problem. The circuit of a low-pass filter is investigated first. Equation (4) is derived. The structure of (4) shows the following: The distribution of the reactive parameters of the required chain circuit must be such that the eigenfrequencies ω_k corresponding to the short-circuit of the circuit and the frequencies ω_k' corresponding to idling, i.e. to the disconnection of the last member, are the frequencies of the series resonances, or the parallel resonances of the inverse chain circuit. This is explained by means of a diagram. Further, it is shown that the problem of the synthesis of a chain circuit can be solved in the following way: according to the given frequencies ω_k and ω_k' and the given summary inductance L, or the inductance of the last link L_n - the factor D (a constant) and the function $F(\omega^2)$ is determined. ω_k are the frequencies of the series resonances; ω_k' are the frequencies of the parallel resonances. $DF(\omega^2)$ is expanded to a continued fraction. The elements of the continued fraction give the inductivity- and capacity values of the circuit. The solution of the problem of the synthesis of the chain circuit is carried out in an analogous

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way for a high-pass filter. In order to avoid the occurrence of great numbers one of the frequencies may be assumed as unity and then the relative values of the given frequencies may be introduced. There are 5 figures and 7 Soviet references.

SUBMITTED: September 3, 1957

1. Oscillator circuits--Analysis 2. Oscillators--Mathematical analysis

SOV/108-13-2-3/15

AUTHOR: Davydov, V. S., Ordinary Member of the Society

TITLE: Graphical Analysis of the Thermostabilization of Common-collector Circuits (Graficheskiy analiz termostabilizatsii emitternykh povtoriteley)

PERIODICAL: Radiotekhnika, 1958, Vol. 13, Nr 2, pp. 23 - 27 (USSR)
Received: April 25, 1958

ABSTRACT: Emitter-repeaters (they are cascades with common collector) are used in order to increase the input resistance in semiconductor amplifiers as well as for fitting together the cascades of high output- and low input-resistance. Here a graphical method of calculating the position of the working point for different design variants of emitter-repeaters with surface triodes is given. The method permits to determine the influence of the scheme elements on the position of the working point and the modification of the input resistance under fluctuations of temperature from the set of statical characteristics. The properties of 5 different design variants are compared with each other and recommendations for the cal-

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Graphical Analysis of the Thermostabilization of Common-collector Circuits

culation of the thermostabilized cascades with a low-level noise are given. A reasonable selection of one or another scheme is depending on the temperature range and the permissible values of R_{input} and the coefficient N of the noise. There are 5 figures, 1 table, and 2 references, 2 of which are Soviet.

SUBMITTED: July 14, 1957

ASSOCIATION: Deystvitel'nyy chlen Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni A.S. Popova.

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DAVYDOV, V.S.

Treshold pickup of photoelectric systems having transformer coupling of vacuum photocells and transistors. Opt.-mekh. prom. 25 no. 2:32-36 F '58. (MIRA 11:7)

(Photoelectric cells)
(Transistors)

SOV/144-59-6-2/15

AUTHOR: Davydov, V.S., Candidate of Technical Sciences, Docent

TITLE: Synthesis of Switch-controlled Networks on the Basis of the Given Input Impedances

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1959, Nr 6, pp 8 - 16 (USSR)

ABSTRACT: The network considered is shown in the diagram of Figure 1. The impedances having an even index form the "longitudinal" elements of the network while the odd-indexed impedances form the transverse elements. The switches having an even index can switch out the longitudinal elements, while the odd-indexed switches can short the transverse elements. If all the even switches are closed and all the odd switches are open, the input impedance of the network is given by Eq (1), where $Y_k = 1/Z_k$. It is assumed that the switches operate sequentially in the order of their increasing indices, i.e. the first switch is open, then the second switch is closed, the third switch is open and so on. It is now necessary to determine the elements of the network such that

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the input impedance will follow a set of pre-determined values, K_o, K_1, K_2, ..., K_{2k} ... . It was shown by D. Bernouilli (Refs 4,5) that a continuous fraction having a given sequence of fractions K_o, K_1, K_2 ... is in the form:

$$K = K_o + \cfrac{K_1 - K_o}{1 + \cfrac{K_1 - K_2}{K_2 - K_o + \cfrac{(K_1 - K_o)(K_2 - K_3)}{K_3 - K_1 + \ldots \cfrac{(K_{n-2} - K_{n-3})(K_{n-1} - K_n)}{K_n - K_{n-2} + \ldots}}}} \quad (2)$$

This expression can be used to synthesise the network. A continuous fraction can be transformed into Eq (3), where the expressions for α are given by Eqs (4). The impedances of the unknown elements can therefore be

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expressed by Eq (6). These can be conveniently expressed in terms of recurrence formulae and the resulting expressions are given by Eqs (7). On the basis of Eq (7), it is possible to design various networks. It is assumed, e.g., that the input impedance of the required network changes in accordance with the following geometric progression:

$$K_n = K_o a^n \qquad (11).$$

From Eq (7), it is now found that the impedances are given by Eqs (12), where ρ is defined by Eqs (13). The resulting network is shown in Figure 2. Figure 3 shows the curves $\rho = f(a)$ for the values of a ranging from -5 to +5. Depending on the value of a, the actual networks take the forms shown in Figure 4. Two further examples of a network design are given in the appendix. The input impedances of the first network are indicated in the table on p 14, while those for the second network are given in

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Synthesis of Switch-controlled Networks on the Basis of the Given Input Impedances

the table on p 15; the first of the networks is shown in Figure 5.
There are 5 figures and 6 references, of which 5 are Soviet and 1 German.

ASSOCIATION: Odesskiy elektrotekhnicheskiy institut svyazi (Odessa Electro-technical Communications Institute)

SUBMITTED: April 10, 1959

Card 4/4

SOV/144-59-12-4/21

AUTHOR: Davydov, V.S., Candidate of Technical Sciences, Dotsent

TITLE: Synthesis of Switched Networks (Second Paper)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1959, Nr 12, pp 26-35 (USSR)

ABSTRACT: In an earlier paper (Elektromekhanika, 1959, Nr 6, Ref 1), the author derived recurrence relations permitting determination of the longitudinal and transverse elements in a network system where the input impedances at various switching stages have pre-determined values. Such a circuit is shown in Fig 1. In this, the switch B_i is closed at the i-th stage, i being even, and B_i is opened for i odd. It is further assumed that all the preceding switches with an even index are closed while all the switches with an odd index are opened. The relations derived are in the form:

$$\frac{Z_{2k}}{Z_{2k-1}} = \frac{(K_{2k-3} - K_{2k-1})(K_{2k} - K_{2k-2})}{(K_{2k-3} - K_{2k-2})(K_{2k-1} - K_{2k})} \quad (1)$$

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$$\frac{Z_{2k+1}}{Z_{2k}} = \frac{(K_{2k-1} - K_{2k-2})(K_{2k+1} - K_{2k})}{(K_{2k-1} - K_{2k+1})(K_{2k} - K_{2k-2})} \tag{2}$$

where K_{2k-3}, K_{2k-2} .... are the given input impedances at various stages, $2k = 2, 4, 6$ ....
Eq (1) and (2) permit the investigation of a number of interesting cases. In particular, it is assumed that the input impedances satisfy the following

$$K_n = a + j\left[b(n+1) - \frac{c}{n+1}\right] \tag{3}$$

where $a = r_o$, $b = \omega L_o$, $c = 1/\omega C_o$; these represent the ohmic and reactive components of the input element of the system; ω is the frequency of the input signal and n is the index of the switching stage. The law represented by Eq (3) defines the case when the input impedance changes according to an arithmetic progression as well as according to the law of inverse proportionality with n. For this case, Eq (1) and (2) can be re-written as Eq (4), where V is defined by the first equation on

stages. Eq (7) represents the case of the arithmetic progression, while Eq (8) shows the inversely proportional dependence of the impedance on n. The structure of the system which corresponds to Eq (7) is shown in Fig 4. The resonant circuits which form this system have the same natural frequency and the same coupling coefficient k as in the more general case. The system corresponding to Eq (8) is represented by the circuit of Fig 5. The above analytical expressions are illustrated by a numerical example, in which the change of the input impedance is given by Eq (3). The numerical example is given in the appendix; it is assumed that $r_o = 1\Omega$, $L_o = 10$ mH and $C_o = 100$ µF. The system is designed in such a way that at successive switching stages, the values of the input impedances are given by Eq (3); the resulting network is indicated in Fig 6. There are 6 figures, 1 table and 2 Soviet references.

ASSOCIATION: Odesskiy elektrotekhnicheskogo instituta svyazi (Odessa

p 28. The impedance of the first transverse element has the value defined by Eq (5); it is seen that the impedance is purely inductive. The coefficients α of Eq (4) for various values of V are indicated in Table 1 on p 28. From the table it is seen that the coefficients α, except α_2, can assume extreme values. Analysis of Eq (4) shows that the dependence of α on V is in the form indicated in Fig 2; the value of V at which the coefficient α_{2k} reaches an extremum is given by the first equation on p 29; similarly the value of V at which α_{2k-1} reaches a maximum is given by the second equation on p 29. On the basis of the above analysis, it is found that the circuit which satisfies the above input impedance law should be in the form shown in Fig 3. The input impedance of such a system is represented by a multiple fraction, whose partial denominators tend to certain limiting values. The resulting circuit is in the form of resonant circuits which are coupled by inductances. The particular cases of Eq (3) are represented by Eq (7) and (8) where K_0 and K_1 are input impedances at the zero and the first switching

Synthesis of Switched Networks (Second Paper) SOV/144-59-12-4/21

Electrical Engineering Communications Institute)

SUBMITTED: July 19, 1959

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APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00050982(

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E041/E455

AUTHOR: Davydov, V.S., Candidate of Technical Sciences, Docent

TITLE: The Synthesis of Ladder Networks With Summation of Input Impedances

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1960, No.7, pp.9-21

TEXT: The circuit considered is that of Fig.1, where "actuation" of a switch implies "closing" in the case of a longitudinal element and "opening" in the case of a transverse one. The problem studied here is the relationship between switch positions and input impedance, and particularly the consequent systematic changes in the latter. In an earlier paper (Ref.1) the author has deduced the recurrence relations (Eq.(1), (2)) from previous work by Daniel Bernoulli. In these expressions the Z's are the network impedances and the K's are the input impedances at successive stages of switching. The basic assumption is the absence, among three neighbouring values of input resistance K, of equalities between them. Suppose the input impedances at the first two stages of switching are K_1 and K_2. It is required to find a circuit which, beginning at the third switching stage,
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has an input impedance at each successive stage equal to the sum of the input impedances of the two preceding stages. The input impedances thus form the set in Eq.(3). The numerical coefficients of Z_1 and Z_0 are the so-called Fibonacci numbers whose general term is Eq.(4). Then Eq.(3) can be re-written as Eq.(6) in terms of K_0 and Z_1/Z_0; the basic recurrence relations are seen in Eq.(7), or more succinctly in Eq.(8). Further equations give the values of the first 11 recurrence coefficients. As k tends to infinity, the coefficients tend to -4.2361 and -0.2361. This means that although the ladder will be nonuniform in its input structure, it eventually becomes homogeneous. Table 1 gives α values up to the thirteenth stage for various values of Z_1/Z_0. The circuit satisfying Eq.(3) is seen in Fig.2. Some deductions may be made about the kind of reactances encountered in the network when Z_1/Z_0 $(=\beta)$ is real. When $\beta > 0$, all longitudinal elements will have a reactive sign opposite to that of the Z_0 element, while all transverse elements will have the same sign as Z_0. The rule for $\beta < 0$ is more complicated; IX

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examples of actual circuits are given diagrammatically in Fig.3 for $\beta = 1$, -0.9, -2.5. It is evident from these examples that the speed with which the elements take on limiting values depends on β. This raises the question whether there is a value of β for which, at one stroke, the elements beginning at Z_2 reach steady values both longitudinally and transversely. The requisite values are $\beta = 0.61805$ and -1.61805, as shown in Fig.4 and 5 respectively. More complex, general cases of extremely nonuniform behaviour are shown in Fig.6 for $\beta = -1.55$ and -1.65. There are 6 figures, 1 table, an appendix and 6 references: 5 Soviet and 1 German.

ASSOCIATION: Odesskiy elektrotekhnicheskiy institut svyazi (Odessa Electrotechnical Institute of Communications)

SUBMITTED: March 17, 1960

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25818
S/142/60/003/006/008/016
E033/E135

9.2572

AUTHOR: Davydov, V.S.

TITLE: Geometrical interpretation of the self-excitation conditions of linear parametric systems

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, 1960, Vol.3, No.6, pp. 613-622

TEXT: This article analyses the LRC circuit shown in Fig.1 in which the inductance changes (due to rotation of the auxiliary coil) according to the law

$$L = L_0 (1 + m \cos 2 \omega t) \tag{1}$$

where: L_0 is the mean value of the inductance; m is the modulation depth ($m < 1$); 2ω is the angular frequency of the change in the inductance. The results are interpreted geometrically. The behaviour of the circuit is determined by the equation

$$L_0 \frac{di}{dt} + ir + \frac{\int i dt}{C} = - m L_0 \frac{d (i \cos 2 \omega t)}{dt} \tag{2}$$

and the solution is obtained in the form:

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$$i = \sum_{n=1}^{\infty} I_n \cos (n \omega t - \varphi_n)$$

where: I_n is the amplitude, and φ_n is the phase of the n^{th} harmonic. It is shown that:

$$\dot{I}_n \cdot \dot{Z}_n = - j \frac{m}{2} (\dot{I}_{n-2} + \dot{I}_{n+2}) \qquad (9)$$

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where: $\dot{I}_n$ is the complex amplitude of the current, and $\dot{Z}_n$ is the complex impedance of the system to the n^{th} harmonic. The currents I_{n-2} and I_{n+2} have frequencies $(n-2)\omega$ and $(n+2)\omega$ relative to a stationary rotor, but induce voltages of frequency $n\omega$ into the rotating coil. With correct amplitude and phase, these induced voltages can compensate for the fall of voltage in the circuit due to the current $\dot{I}_n$. Thus, Eq.(9) expresses Kirchoff's second law for a parametric system, and oscillations can be maintained. It follows that the system can sustain odd harmonics, as well as oscillations of the fundamental frequency ω. From Eq.(9), the self-excitation process can be written as an infinite system of recurrent equations:

$$\dot{Z}_1 = -j\frac{m}{2}\left(e^{j2\varphi_1} + \frac{\dot{I}_3}{\dot{I}_1}\right); \tag{10}$$

$$\dot{Z}_3 = -j\frac{m}{2}\left(\frac{\dot{I}_1}{\dot{I}_3} + \frac{\dot{I}_5}{\dot{I}_3}\right); \tag{11}$$

$$\dot{Z}_n = -j\frac{m}{2}\left(\frac{\dot{I}_{n-2}}{\dot{I}_n} + \frac{\dot{I}_{n+2}}{\dot{I}_n}\right). \tag{12}$$

The difference between the form of Eq.(10) and the remainder indicates a fundamental difference: the system functions as a generator, converting mechanical energy into electrical, for the first harmonic ω, but as a motor for the remaining harmonics. From Eqs.(10)-(12) are obtained:

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$$\frac{m}{2} e^{j\left(2\varphi - \frac{\pi}{2}\right)} = \dot{Z}_1 + \cfrac{\frac{m^2}{4}}{Z_3 + \cfrac{\frac{m^2}{4}}{Z_5 + \cfrac{\frac{m^2}{4}}{Z_7 + \dots + \cfrac{\frac{m^2}{4}}{Z_n + \dots}}}} ; \quad (16)$$

$$\frac{I_2}{I_1} = -j \cfrac{\frac{m}{2}}{Z_3 + \cfrac{\frac{m^2}{4}}{Z_5 + \cfrac{\frac{m^2}{4}}{Z_7 + \dots + \cfrac{\frac{m^2}{4}}{Z_n + \dots}}}} \quad (17)$$

$$\frac{I_n}{I_{n-2}} = -j \cfrac{\frac{m}{2}}{Z_n + \cfrac{\frac{m^2}{4}}{Z_{n+2} + \cfrac{\frac{m^2}{4}}{Z_{n+4} + \dots}}}$$

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Eq.(16) determines the conditions for self-excitation and Eq.(17) gives the ratio of the amplitudes of the harmonics of the current, i.e. its shape. In practice, the series converges rapidly. The above equations enable an equivalent circuit to be obtained; the infinite, inhomogeneous, reiterative circuit shown in Fig.3. Eq. (16) can be re-written:

$$\frac{m}{2} e^{j\left(2\varphi_1 - \frac{\pi}{2}\right)} = \dot{Z}_э \qquad (19)$$

where $\dot{Z}_э$ is the impedance of the equivalent circuit. For a given depth of modulation m, the locus of the vector

$$\frac{m}{2} e^{j(2\varphi_1 - \frac{\pi}{2})}$$

is a circle of radius m/2 with its centre at the origin of the coordinates. Thus, the boundary conditions for self-excitation are determined by the points at which this circle and the locus of the impedance $\dot{Z}_э$ intersect. When either the attenuation or the detuning (relative to $\omega_0 = 1/\sqrt{L_0C}$) is altered, the locus of $\dot{Z}_э$ becomes a curve, the degree of which depends on the number of

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current harmonics considered. The following cases are developed: the first approximation for small modulation depth when only the first harmonic is considered; the second approximation when the third harmonic is considered. The locus of $\mathring{Z}_3$ then becomes a circular cubic; and the third approximation, when the fifth harmonic is considered and the locus of $\mathring{Z}_3$ becomes a bicircular quintic. From Eq.(17) the geometrical representation of the relative amplitudes may be obtained. The procedure can be extended to parametric systems where the modulation depth or the attenuation are varied instead of the inductance, and also to systems where the parametric variation is not sinusoidal.
There are 7 figures and 13 figures: 10 Soviet and 3 German.

X

ASSOCIATION: Kafedra energetiki svyazi, Odesskogo elektrotekhnicheskogo instituta svyazi (Department of Telecommunication Power Supply, Odessa Electrotechnical Institute of Communications)

SUBMITTED: June 5 1959, and after revision 26 March 1960.

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88166

S/144/60/000/010/001/010
E194/E355

9.3230 (also 1009, 1031)

VASILIY Stepanovich

AUTHOR: [redacted]., Candidate of Technical Sciences, Docent

TITLE: Certain General Relationships in the Synthesis of Switched Chain Circuits

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Elektromekhanika, 1960, No. 10, pp. 3 - 17

TEXT: This is one of a series of articles by the same author published in this journal - 1959, Nos. 6 and 12 and 1960, No. 7.

Bernoulli's problem concerns the determination of the structure of a chain fraction from the given sequence of its constituent fractions. From the solution of the problem the author has, in previous work, derived recurrent relationships which may be used for successive determination of the impedances of elements of a chain circuit whose impedances at various stages of switching should be of predetermined values. In the notation used, series impedances and switches are denoted by the letters Z and B, respectively, with even-number suffixes. Shunt impedances Z

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which are themselves shunted by switches B are denoted by odd-number suffixes. The i-th stage of switching is taken to mean a condition of the circuit in which the switch B_i is closed with i even (i = 2k) or the switch B_i is open with i uneven (i = 2k + 1), assuming that all preceding series switches are closed and all preceding shunt switches are open. The ratio α_{2k} is defined as the total impedance ratio Z_{2k}/Z_{2k-1}. A similar definition is given for

$$\alpha_{2k+1} = Z_{2k+1} / Z_{2k} .$$

In deriving the expressions for α no limitations are put on the values of the input impedances. The only stipulation for a chain circuit is that three neighbouring terms of the

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input impedance expression should not be equal to one another. The theory of finite differences is used to obtain expressions for the coefficients α in terms of m. The latter is the ratio of the second finite difference of a series of input impedances to the first difference.
The author has used these expressions for α in his previous work to consider a number of particular cases of synthesis of switched chain circuits for certain simple laws of change of input impedance. For certain laws of change of input impedance, commencing with the input impedance Z_2 the circuit becomes uniform and in other cases the impedances of the series and shunt elements alter along the chain but tend to limiting values. It is apparently important to establish general relationships governing the structural peculiarities of switched chain circuits that satisfy given laws of change of input impedance. It is the object of the present work to establish such relationships relating

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the structure of the desired chain circuit to the character of changes of input impedances. The first conditions determined are those for which, commencing with the element Z_2, the chain circuit is uniform. An equation is derived and a curve of $\alpha_{2k} = f(m)$ is given in Fig. 2. The curve is a hyperbola having as asymptotes the lines $m = -1$ and $\alpha_{2k} = -(m + 3)$ with inflection points at $m = 0$, $\alpha_{2k} = -4$ and $m = -2$, $\alpha_{2k} = 0$.
It is then shown that the sequence of input impedances for which the ratio m is constant should satisfy a uniform linear finite-difference equation of the second order with constant coefficients. A solution is given in expressions (5) to (8). The coefficients α are constant when successive input impedances are either in arithmetic or geometric progression and constant. The physical meaning of the shape of the hyperbolic curve of Fig. 2 is discussed.
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It is then shown that α_2 differs from the successive values α_{2k} by a factor $(1/m + 2)$. In particular, in the case of the arithmetical progression for which $m = 0$, the coefficient α_2 should have the value of -2 whilst all successive coefficients α_{2k} are equal to -4. When the series elements of the circuit are inductive and the shunt is capacitative, the ratio of the natural frequency of the circuits to the frequency of the supply circuit is given by expression (11). Values of this ratio as a function of m are plotted in Fig. 5. The case is then considered when the coefficients α (independently of the index $2k$) are equal to ± 1 and Eq. (12) is derived for K_m. This sequence of input impedances leads to a further expression for α_2. Fig. 6 shows the structure of chain circuits with purely

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reactive elements. The input impedances satisfy expression (12) for the two cases when: K_o = 1 ohm, K_1 = 2 ohm, and K_o = 1 ohm, K_1 = 0.5 ohm, it being assumed in both cases that the element Z_o is inductive. Eq. (13) is then derived for K under different conditions and a similar structural chain circuit with purely reactive elements satisfying Eq. (13) is given in Fig. 7 for the same values of K_o and K_1 as before. The case of $\alpha_{2k} = \alpha_{2k+1} = -1$ is considered next; Eq. (14) is derived for K_n and a further expression is derived for α_2. Fig. 8 then shows the structure of chain circuits with purely reactive elements, the input impedances of which in successive stages of switching satisfy Eqs. (14) for the initial conditions K_o = 1 ohm, K_1 = 2 ohm. The

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second root of the expression for m leads to Eq. (15) for K, giving the circuit of Fig. 9. In order that a chain circuit starting with the element Z_2 should be uniform it is sufficient but not necessary that the value of m_n should be constant. It is also possible that m_n depends on n but the coefficients α_{2k} and α_{2k+1} still remain constant along the chain. The conditions are next considered in which this occurs. It is required to formulate two chain circuits with successive input impedances $K_n = f(n)$ and $K'_n = 1/K_n$. An example of chain circuits that satisfy the mutual inverse relationship of change of input impedance are circuits that fulfil the law of arithmetic progression, $K_n = K_o + d.n$ and the inverse relationship law $K_n = K_o/(n + 1)$. Although

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circuits that satisfy the inverse law of input impedances have the same values of the coefficient α_{2k} and α_{2k+1}, the impedances of the elements of the two circuits are different because the coefficients α_2 are different. The more general case of a second-order sequence given by the formula $K_n = aK_{n-1} + bK_{n-2}$ is then considered. The method of solution of this equation is described. Part of this question has already been treated in one of the previous articles in the series. If the characteristic equation has a conjugate pair of complex roots the solution of the finite different Eq. (17) given above contains trigonometric functions of n. Consequently, the sequence of input impedances is cyclic and accordingly the chain circuits have certain special

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structural features. This case will be examined in a further article. However, further brief consideration is given to Eq. (17) here.
There are 10 figures, 1 table and 5 Soviet references.

ASSOCIATION: Odesskiy elektrotekhnicheskiy institut svyazi (Odessa Electrotechnical Institute of Communications)

SUBMITTED: October 7, 1960

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86883

S/108/60/015/012/005/009
B010/B059

AUTHORS: Voyshvillo, G. V., Member of the Society, Davydov, V. S., Member of the Society, Solov'yev, N. V., Member of the Society

TITLE: Transmission of White and Frequency-dependent Background by an Amplifier With a Low Q-Value

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 12, pp. 21 - 24

TEXT: The mean square background voltage at the output of a one- to three-stage selective amplifier as depending on the amplifier quality is calculated, considering white and 1/f-background only. The frequency response of an amplifier with N identical stages is described by (1) $K = K_0/\left\{\sqrt{1+\left[Q(f/f_0 - f_0/f)\right]^2}\right\}^N$, where K and K_0 denote the amplification factors at the frequencies f and f_0, respectively, and Q the quality of each stage. $d(\bar{U}^2_{r1}) = W(f)df$ with $W(f)$ denoting the spectral density of the background efficiency, and U_r the background voltage. $W(f) = W_0$ for white

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APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00050982(

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Transmission of White and Frequency-dependent S/108/60/015/012/005/009
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background, and therefore $\bar{\ddot{U}}^2_{r2} = \int_0^\infty W_o K^2 df$, where K has to be substituted from (1). The results of integration are compiled in Table 1. The first column gives the number of amplifier stages, the second the mean square output voltage of white background, $\bar{\ddot{U}}^2_{r2}$. For 1/f-background, $W(f) = W_1 f_1/f$, where W_1 is the background density at f_1, and therefore $\bar{\ddot{U}}^2_{r2} = \int_0^\infty \frac{f_1}{f} W_1 K^2 df$, where K is to be substituted from (1). The results of this integration are shown in Table 2; the number of amplifier stages is given in the first column, the Q-values in the second, and the mean square output voltage of the frequency-dependent background, $\bar{\ddot{U}}^2_{r2}$, in the third. Graphs illustrate the relation between $\bar{\ddot{U}}^2_{r2}$ and Q, e.g., Fig.2 for N = 2 (upper curve for white, lower curve for 1/f-background). Finally, the authors point out the possibility of determining the ratio between instantaneous

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APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00050982(

Transmission of White and Frequency-dependent Background by an Amplifier With a Low Q-Value S/108/60/015/012/005/009 B010/B059

signal amplitude and mean square background by means of the formulas given. There are 4 figures, 2 tables, and 3 Soviet references.

SUBMITTED: November 30, 1959 (initially), May 23, 1960 (after revision)

(Table 1) Таблица 1

Число каскадов усилителя N	Средний квадрат выходного напряжения белого шума $\overline{U}^2_{ш2}$
1	$\frac{\pi f_0}{2Q} W_0 K_0^2$
2	$\frac{\pi f_0}{4Q} W_0 K_0^2$
3	$\frac{3\pi f_0}{16Q} W_0 K_0^2$

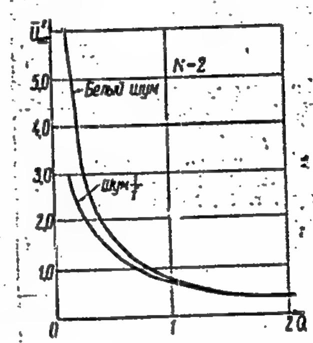

Рис. 2 (Fig. 2)

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(Table 2) Таблица 2

Число каскадов усилителя N	Значение добротности Q	Средний квадрат выходного напряжения частотно-зависимого шума $\overline{U^2_{ш2}}$
1	$Q<0{,}5$	$\dfrac{W_1 f_1 K_0^2}{\sqrt{1-4Q^2}}\,\mathrm{ar\,th}\,\dfrac{\sqrt{1-4Q^2}}{1-2Q^2}$
1	$Q>0{,}5$	$\dfrac{W_1 f_1 K_0^2}{\sqrt{4Q^2-1}}\,\mathrm{arc\,ctg}\,\dfrac{1-2Q^2}{\sqrt{4Q^2-1}}$
2	$Q<0{,}5$	$\dfrac{W_1 f_1 K_0^2}{1-4Q^2}\left(\dfrac{1-2Q^2}{\sqrt{1-4Q^2}}\,\mathrm{ar\,th}\,\dfrac{\sqrt{1-4Q^2}}{1-2Q^2}-1\right)$

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B012/B077

9.3230 (also 1031)

AUTHORS: Voyshvillo, G. V., Member of the Society, Davydov, V. S., Member of the Society, Solov'yev, N. V., ~~Member of the Society~~

TITLE: Passage of Impulse Signals Through a Low-quality Amplifier

PERIODICAL: Radiotekhnika, 1960, Vol. 15, No. 10, pp. 35-40

TEXT: This is an investigation of the passage of impulse signals consisting of steplike and linear increasing components through a low-quality resonance amplifier. The latter consists of equal rheostat or single-circuit cascades with 1 to 3 cascades. The investigation of the passage of impulse signals is limited to those which can easily be divided into components of the following type:

$$u_1(t) = 1(t-t_0) \quad (2) \quad \text{and}$$

$$u_1(t) = a(t-t_0) \cdot 1(t-t_0) \quad (3)$$

The present investigation is based on finding the transitional amplification factor

$$\varkappa(t) = \left[u_2(t)\right]_{u_1(t)=0} \quad (5)$$

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Passage of Impulse Signals Through a Low-quality Amplifier S/108/60/015/010/012/016/XX B012/B077

and the voltage at the amplifier output with a linearly increasing input voltage

$$u_2(t) = \left[u_2(t)\right]_{u_1(t)=at.1(t)} \quad (6).$$

In order to determine these two voltages, the operator-method based on the Laplace transformation is employed. Fig. 2 shows the equivalent-circuit diagram for the rheostat amplifier, for this case the equations for the parameters K_o, Q, and ω_o are written. Here, the functions (5) and (6) are of the form

$$v_2(p) = K_o/p \left\{1+Q(p/\omega_o+\omega_o/p)\right\}^N \quad (8) \text{ or}$$

$$u_2(p) = aK_o/p^2 \left\{1+Q(p/\omega_o + \omega_o/p)\right\} .$$

Figs. 3 to 8 show the curves of the functions for N=1, 2, or 3. N represents the number of cascades. The output voltages of amplifiers with any resonance frequencies ω_o at different slopes of the input signal a can be determined from these curves. Using these curves it is also possible to find the output voltage produced under the influence of input signals formed by components (2) and (3). The results of this investigation make it possible to find the largest instantaneous values of the output

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voltage as a function of the quality Q and the resonance frequency ω_0. The studies of V. G. Vol'pyan (Refs. 5,6) are mentioned. There are 12 figures, 2 tables, and 6 Soviet references.

SUBMITTED: November 30, 1959 (initially)
May 23, 1960 (after revision)

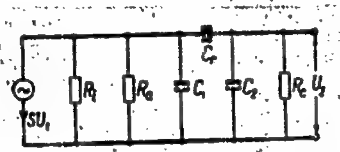

Рис. 2

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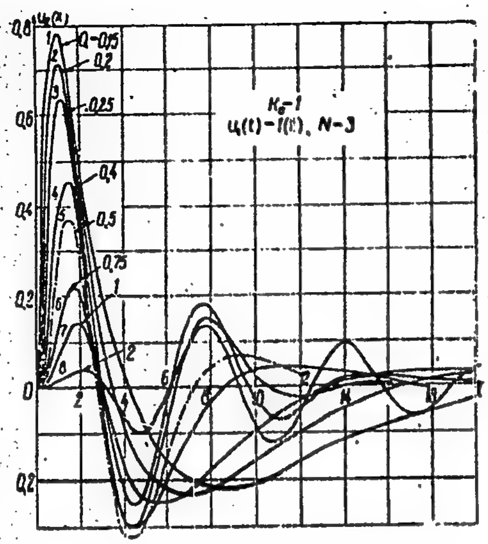

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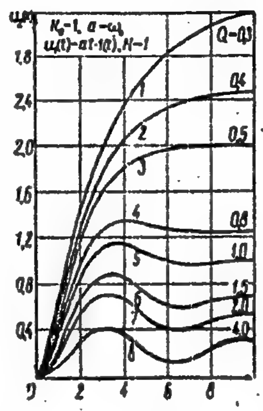

Рис. 6

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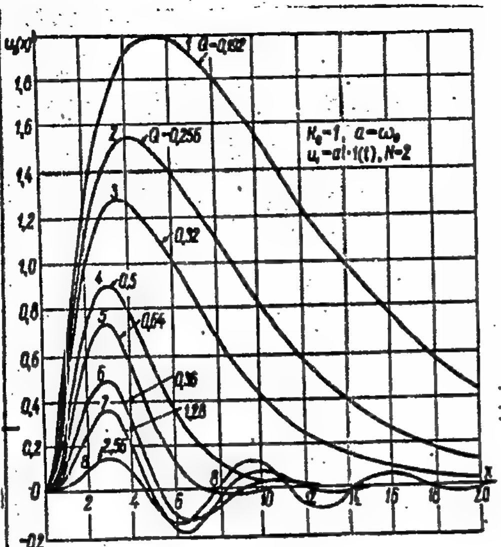

Рис. 7

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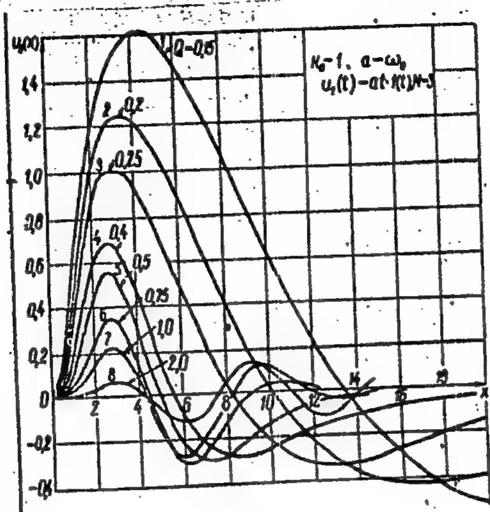

Рис. 8

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VOYSHVILLO, G.V.; DAVYDOV, V.S.; SOLOV'YEV, N.V.

Passing of white noise and frequency dependent noise through an amplifier with a low factor of merit. Radiotekhnika 15 no.12: 21-24 D '60. (MIRA 14:9)

1. Deystvitel'nyye chleny Nauchno-tekhnicheskogo obshchestva radiotekhniki i elektrosvyazi imeni Popova.
(Amplifiers (Electronics)--Noise)

DAVYDOV, V.S.

Calculation of steady-state conditions in a linear electrical system with variable parameters. Elektrichestvo no.4:51-58 Ap '61. (MIRA 14:8)

1. Odesskiy elektrotekhnicheskiy institut svyazi.
(Electric networks) (Electric transformers)

33129

9.3230 (1040, 1139)

S/105/61/000/012/002/006
E140/E963

AUTHOR: Davydov, V. S. (Odessa)

TITLE: On the calculation of ladder circuit input impedance

PERIODICAL: Elektrichestvo, no.12, 1961, 44-49

TEXT: The author considers a circuit of the type shown in Fig.1. The input impedance $K_0 = Z_0$ is defined as the input impedance with all switches of even index open except B_0, and all switches of odd index closed. $K_1 = Z_0 + Z_1$ is obtained by opening B_1; K_2 is obtained by closing B_2, and K_3 is obtained by further opening B_3, etc. Using the theory of continued fractions, the author obtains a recursive formula for K_n in terms of K_{n-1}, K_{n-2} and K_{n-3}. Among the applications of this method, the author gives the calculation of the driving point impedance of a four-terminal network as a function of load impedance, given only the possibility of making measurements at the external terminals. Further, a circuit is derived in which

$$K_n = K_0 + dn, \qquad (10)$$

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S/105/61/000/012/002/006
E140/E963

i.e., the successive impedances are in arithmetic progression (Fig.5). A further application gives a circuit in which the driving point impedances are in geometric progression (Fig.6). The equation for this line is given by

$$K_n = K_0 q^n = Z_0 q^n \quad (n = 0, 1, 2, 3, \ldots).$$

There are 6 figures and 6 references: 5 Soviet and 1 non-Soviet-bloc.

SUBMITTED: 30 January, 1961.

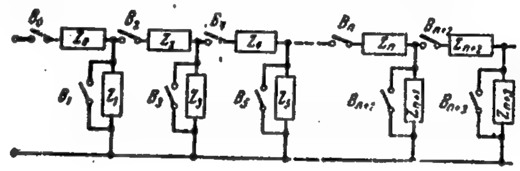

Fig.1

33794
S/108/62/017/002/009/010
D201/D305

6,9411 (1159)

AUTHORS: Davydov, V.S., and Romanov, A.M., Members of the Society (see Association)

TITLE: Passage of pulse signals and of noise through a staggered tuned two-stage amplifier

PERIODICAL: Radiotekhnika, v. 17, no. 2, 1962, 64 - 70

TEXT: The authors consider the effect of staggered tuning, expressed as the ratio $m = f_{02}/f_{01}$, of two stages of equal Q's in the passage through the amplifier of step- and linearly increasing voltages; they consider also the effect of noise having a constant 1/f varying spectral density. The analysis makes it possible to evaluate the S/N ratio as a function of m and Q. The output voltage resulting from the step- and linearly varying input voltages is determined by assuming: $U_1(t) = 1(t)$ and $U_1(t) = at(1(t))$, taking their Laplace transforms, multiplying the transforms by the transform of the transfer function of the amplifier and by drawing the

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graphs of the output voltage in both cases as a function of $Q \leqslant 0.5$. The graphs show that with a decreased staggering the time during which the output signal reaches its maximum (t_1) and then becomes zero (t_2) increases. The duration of t_1 and t_2 of the amplifier response to a step-input is less than that for a linearly increasing input voltage. The passage of white and frequency-dependent noise through the amplifier is analyzed by taking the r.m.s. value of noise in an infinitely narrow band df, from which the r.m.s. value of this noise at the output is evaluated as

$$\overline{U}^2_{n'} = \int_0^\infty W(f)\,\kappa^2(f)\,df, \tag{3}$$

where

$$\kappa(f) = |\kappa(\mathrm{i}f)|,$$

$$\kappa^2(f) = \frac{\kappa_0^2}{\left\{1+\left[Q\left(\frac{f}{f_{01}}-\frac{f_{01}}{f}\right)\right]^2\right\}\left\{1+\left[Q\left(\frac{f}{mf_{01}}-\frac{mf_{01}}{f}\right)\right]^2\right\}}$$

in which $K_0^2 = K_{01} \cdot K_{02}$ (overall gain at resonance). The graphs of

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Passage of pulse signals and of ... S/108/62/017/002/009/010
D201/D305

(3) for m = 1, $\sqrt{2}$ and 2 are shown as a function of Q. By combining the results of the two parts of the analysis, the ratios of the instantaneous values of output voltage at its first maximum to the r.m.s. value of noise at the output is easily determined. The authors acknowledge helpful suggestions by G.V. Voyshvillo. There are 2 tables, 10 figures and 2 Soviet-bloc references.

ASSOCIATION: Nauchno-tekhnicheskoye obshchestvo radiotekhniki i elektrosvyazi im. A.S. Popova (Scientific and Technical Society of Radio Engineering and Electrical Communications imeni A.S. Popov)[Abstractor's note: Name of Association taken from first page of journal]

SUBMITTED: March 28, 1961

Card 3/3

DAVYDOV, V.S.

Resonant frequencies of homogeneous ladder networks. Elektrichestvo no.2:10-17 F '63. (MIRA 16:5)

1. Odesskiy elektrotekhnicheskiy institut svyazi.
(Electric networks)

DAVYDOV, Vasiliy Stepanovich, kand.tekhn.nauk, dotsent

Synthesis of coupled oscillatory systems with a repeating cycle of input impedances. Izv. vys. ucheb. zav.; elektromekh. 6 no.3: 303-315 '63. (MIRA 16:5)

1. Odesskiy elektrotekhnicheskiy institut svyazi.
(Electric networks)

DAVYDOV, V.S.

Study of heat transfer in transverse flow about a cylinder dampened by a compressible current. Trudy LPI no.228:36-43 '63. (MIRA 17:1)

APPROVED FOR RELEASE: Thursday, July 27, 2000 CIA-RDP86-00513R00050982(

ACCESSION NR: AP4038622 S/0109/64/009/004/0710/0715

AUTHOR: Davy*dov, V. S.; Mel'nik, O. N.

TITLE: Semiconductor logarithmic amplifier

SOURCE: Radiotekhnika i elektronika, v. 9, no. 4, 1964, 710-715

TOPIC TAGS: logarithmic amplifier, semiconductor amplifier, piecewise linear characteristic, transistor, diode

ABSTRACT: Instead of using a large number of identical diode cells in tandem to synthesize a piecewise-linear logarithmic amplifier characteristic, all the non-linear elements are concentrated in the proposed amplifier in a single stage. The use of series-connected transistors with opposite conductivities provides a high output resistance, a large dynamic current range, and additional symmetry. The proposed circuit (see Fig. 1 of Enclosure) is analyzed and a design procedure is outlined. The output resistance attained with standard transistors is 300--500 KΩ and the range of input signals on the logarithmic part of the voltage-current characteristic (see Fig. 2 of Enclosure) is 60 dB. The slope of the characteristic (2.1 V/de-

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ACCESSION NR: AP4038622

cade) and the deviation from logarithmic variation reaches 1 dB. The temperature instability at 50C is about 0.5 dB. Laboratory tests indicate that the high time stability of the characteristics and the good reproductibility when different elements are used make the amplifier suitable for measurement purposes. Orig. art. has: 6 figures and 9 formulas.

ASSOCIATION: None

SUBMITTED: 04Feb63 ENCL: 02

SUB CODE: EC NO REF SOV: 002 OTHER: 002

Card 2/4

ACCESSION NR: AP4038622

ENCLOSURE: 01

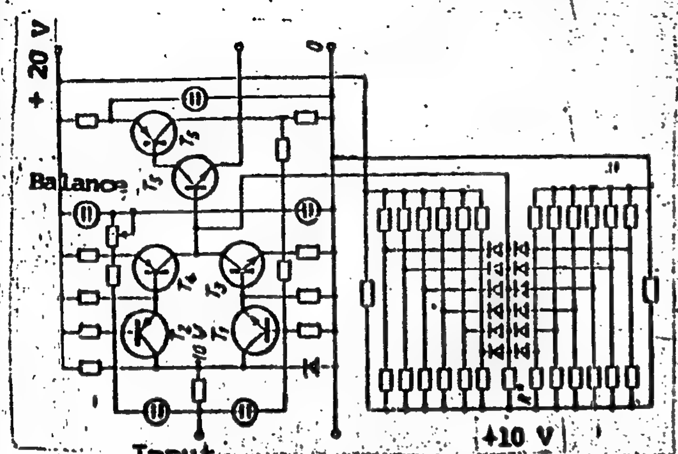

Fig. 1. Semiconductor logarithmic amplifier

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ACCESSION NR: AP4038622 ENCLOSURE: 02

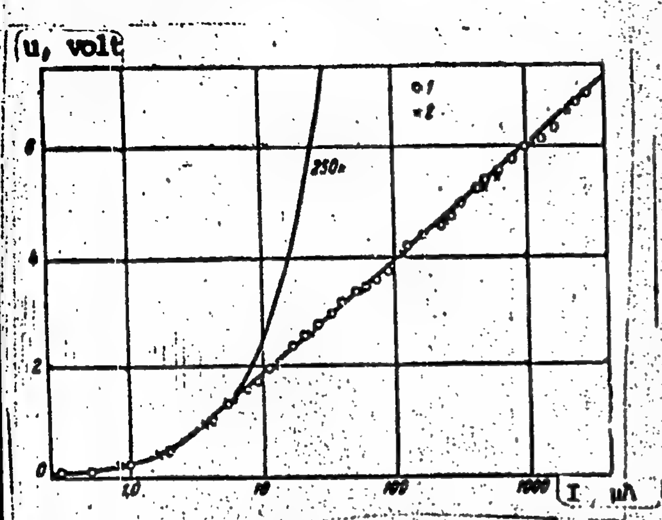

Fig. 2. Voltage-current characteristic of logarithmic cell of silicon diodes (8 point-contact and 4 junction diodes), measured with direct current. (1 - 20C, 2 - 50C)

Card 4/4

DAVYDOV, V.S., inzh.

Photoelectric dynamometer for turbomachines. Energomashinostroenie 10 no.8:41-43 Ag '64. (MIRA 17:11)

L 27774-65 EWT(1)/EWT(m)/EPF(c)/EPF(n)-2/EWG/EPA(w)-2/T/EPA(bb)-2/EWA(1) Pr-4/ Ps-4/Pu-4/Pab-10 RWH/WW

ACCESSION NR: AT5003389 S/2563/64/000/232/0047/0051 48 46 B+1

AUTHOR: Davydov, V. S.

TITLE: Heat transfer distribution along the circumference of a cylinder within a transverse humid compressible flow

SOURCE: Leningrad. Politekhnicheskiy institut. Trudy, no. 232, 1964. Turbomashiny (Turbomachines), 47-51

TOPIC TAGS: biphasic flow, steam turbine, turbine heat transfer, blade cooling, vapor blade cooling, cylindrical heat transfer distribution, transverse flow

ABSTRACT: Following the discovery of the practicability of the design of high-temperature turbines with vapor cooling of the blade systems (V. A. Zysin, V. S. Davydov, Energomashinostroyeniye, 1961, no. 1, pp 28-30), the author established experimentally the essential influence of the suspended moisture (within the cooling vapor jet) on the heat transfer intensity (Trudy LPI, 1963, no. 228, pp 36-43). However, these tests studied only the overall heat transfer from a cylinder within a transverse flow. The present work investigated the local heat transfer along the cylinder's circumference. Using the same experimental stand as before, the author

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L 27779-65

ACCESSION NR: AT5003389

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established that the changes in the local heat transfer values during biphasic flow do not introduce significant modifications into the single-phase heat transfer distribution. This may be explained by the fact that, for a sufficiently fine suspension, the droplets near the cylinder essentially follow the lines of vapor flow and the heat exchange is determined basically by the peculiarity of the process going on within the boundary layer. Orig. art. has: 5 formulas and 3 figures.

ASSOCIATION: Leningradskiy politekhnicheskiy institut imeni M. I. Kalinina (Leningrad polytechnic institute)

SUBMITTED: 00 ENCL: 00 SUB CODE: PR, TD

NO REF SOV: 006 OTHER: 001

Card 2/2

ZYSIN, V.A., doktor tekhn.nauk; DAVYDOV, V.S., inzh.

Heat emission of a flow about a cascade of blades carrying suspended moisture. Energomashinostroenie 11 no.8:40-41 Ag '65. (MIRA 18:10)

DAVYDOV, Vitaliy Timofeyevich

Baikal. Moskva, Sovetskii khudozhnik, 1964. 71 p.
(MIRA 18:4)

MAN'KOVSKIY, G.I.; DAVYDOV, V.V.; ODINOKOVA, L.V.; KAMENSKIY, I.V.; OGNEVA, N.Ye.; KOGAN, N.N.; GOGUADZE, TS.A.

Solution for binding rocks. Gor. zhur. no.9:75 S '63.
(MIRA 16:10)

DAVYDOV, V.V., kand. tekhn. nauk; GRANKIN, I.G., inzh.; ZHUKOVIN, D.I., inzh.

Apparatus for determining and automatically recording the hardening time of resins. Nauch. soob. IGD 18:192-196 '63. (MIRA 16:11)

ALEKSEYEV, N.V.; ARIFKHANOV, U.R.; VLASOV, N.A.; DAVYDOV, V.V.; SAMOYLOV, L.N.

Apparatus for studying the polarization of fast neutrons. Atom. energ. 15 no.1:62-64 Jl '63. (MIRA 16:8)
(Neutrons) (Polarization (Nuclear physics))

ALEKSEYEV, N.V.; ARIFKHANOV, U.R.; VLASOV, N.A.; DAVYDOV, V.V.;
SAMOYLOV, L.N.

Neutron polarization in the reactions $T(p, n)He^3$ and $D(d, n)He^3$.
Zhur. eksp. i teor. fiz. 45 no.5:1416-1424 N '63. (MIRA 17:1)

IVONIN, Ivan Pavlovich; DAVYDOV, Viktor Viktorovich; ZORIN, Leonid Fedorovich; IVANNIKOV, Ivan Andreyevich; AKSENOV, V.P., kand. tekhn. nauk, retsenzent; BYKHOVSKAYA, S.N., red. izd-va; MAKSIMOVA, V.V., tekhn. red.

[Open pit mining of native sulfur deposits] Otkrytaia razrabotka mestorozhdenii samorodnoi sery. Moskva, Gosgortekhizdat, 1963. 303 p. (MIRA 17:1)
(Sulfur mines and mining) (Strip mining)

DAVYDOV, V.V., kand.tekhn.nauk; DAVYDOV, V.V., inzh.

Baring operations in the diamond mines. Shakht.stroi, 5 no.5:30-32 Ap '61. (MIRA 14:5)
(South-West Africa—Diamond mines and mining)

ACCESSION NR: AP4043612 S/0056/64/047/002/0433/0438

AUTHORS: Alekseyev, N. V.; Arifkhanov, U. R.; Vlasov, N. A.; Davy*dov, V. V.; Samoylov, L. N.

TITLE: Polarization of neutrons in the reaction $T(d, n)He^3$

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 433-438

TOPIC TAGS: neutron reaction, polarization, deuteron scattering, tritium, alpha particle reaction

ABSTRACT: This is a continuation of earlier research with He^3 (ZhETF v. 45, 1416, 1963) and is aimed at attaining polarized neutrons of higher energy than in the past. The energies of the incident deuterons ranged from 9 to 19 MeV and analysis was by means of scattering from a gaseous helium scintillator connected for a coincidence circuit with two neutron counters. To exclude the effects of geometrical asymmetry, the neutron spin was turned through 90° in the

ACCESSION NR: AP4043612

longitudinal magnetic field of a solenoid, with the reversal of the scattering direction from left to right and vice versa being produced by reversing the direction of the current in the solenoid. The polarization of the neutrons in the reaction $T(d, n)He^4$ at a laboratory angle close to 30° exceeds 50% over a wide range of deuteron energies, so that strongly polarized neutrons with energy up to 40 MeV can be produced by this reaction. Resonance effects previously observed upon variation of the cross section of the reactions $T(d, n)He^4$ in the ground and 20-MeV excited states, as well as in dT scattering, were also observed in the present results. These resonance effects must be taken into account in the phase shift analysis of the α-n scattering, and are connected with the excited states of the He^5 nucleus (16.7 and 20 MeV). "The authors are grateful to S. P. Kalinin and N. I. Venikov for interest in the work and for ensuring operation of the cyclotron, and also V. A. Kovtun and V. A. Stepanenko for preparing the tritium targets." Orig. art. has: 4 figures and 1 table.

ACCESSION NR: AP4043612

ASSOCIATION: None

SUBMITTED: 02Mar64 ENCL: 02

SUB CODE: NP NR REF SOV: 003 OTHER: 014

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ACCESSION NR: AP4043612 ENCLOSURE: 01

Summary data on neutron polarization

E_d, MeV	$\theta_{1лаб}$, град lab.deg.	E_n, MeV	$\theta_{2лаб}$, град	ε, %	$\bar{P}_1$, %	P_1, %
8,7±0,7	30	24,7	123	36,0±2,6	67,2	53,7
11,0±0,6	30	26,0	123	38,0±3,0	60,7	54,5
11,7±1,0	30	27,5	123	30,2±2,3	74,0	53,0
12,2±0,5	30	28,0	123	43,0±3,4	75,0	58,6
13,1±0,0	30	28,8	123	45,3±3,0	76,2	50,5
15,4±0,0	30	30,0	123	41,4±4,2	80,3	51,6
17,3±0,8	30	32,6	123	37,5±4,3	82,5	45,5
19,0±0,8	15	35,9	123	4,1±5,1	84,6	4,8
19,0±0,8	30	34,1	123	36,5±4,4	83,1	44,0
19,0±0,8	45	31,4	123	15,6±3,2	70,0	19,6
19,0±0,8	73	25,2	123	12,6±5,9	68,0	18,5
19,0±0,8	92	21,1	123	—13,2±10,3	58,8	—20,7
19,0±0,8	30	34,1	103	13,4±6,5		
19,0±0,8	30	34,1	135	38,2±6,0		
19,0±0,8	30	34,1	145	30,3±4,8		

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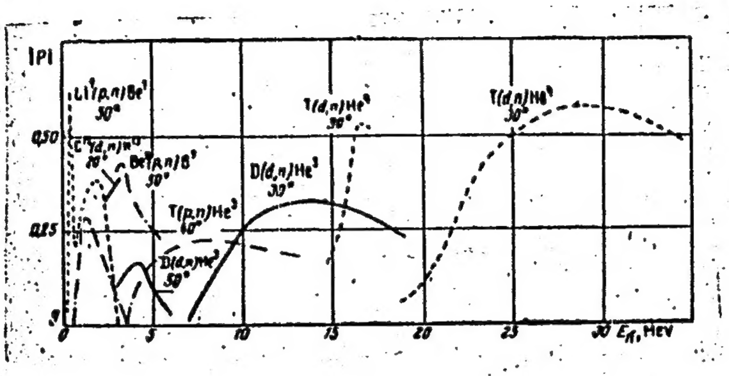
ACCESSION NR: AP4043612

ENCLOSURE: 02



Neutron polarization in different nuclear reactions

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L 13763-65 EWT(m)/EWA(h) AFWL/SSD/ESD(t)
ACCESSION NR: AP4044581 S/0053/64/083/004/0741/0752

AUTHOR: Alekseyev, N. V.; Arifkhanov, U. R.; Vlasov, N. A.; Davy*dov, V. V.; Samoylov, L. N.

TITLE: Sources of polarized fast neutrons 19

SOURCE: Uspekhi fizicheskikh nauk, v. 83, no. 4, 1964, 741-752

TOPIC TAGS: neutron polarization, deuteron bombardment, proton bombardment, neutron counter, nucleon scattering

ABSTRACT: This is a state-of-the-art review devoted primarily to sources of fast polarized neutrons (FPN) of medium energy (up to 35 Mev). The history of FPN research and some of the problems that can be solved with its aid are briefly reviewed. Along with mentioning various methods for polarization measurements and comparing their advantages and disadvantages, the authors describe the installation used for this purpose at the Institut atomnoy energii im.

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